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THE GHOSTS OF REBEL TORPEDOES: INTEGRATED NAVAL MINING AS A DECISIVE FACTOR IN LITTORAL WARFARE

by

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The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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ABSTRACT

The employment of naval mines can be subdivided into two categories - where mines are used as stand-alone weapons, and where they are fully integrated with other maritime components. History has shown that integrated naval mining can be a decisive factor in littoral warfare. Successful integration requires the production of four operational conditions in a littoral theater. In two case studies, the Confederate defense of Charleston and the Turkish stand in the Dardanelles, integrated defensive mining incorporating these four conditions facilitated the defeat of superior adversaries. In more recent times, Iran has focused its maritime strategy on employing an integrated capability in the Persian Gulf, targeted directly at the U.S. Navy's endemic weaknesses in mine countermeasures.

In preparation for a major amphibious landing against North Korea, on October 10, 1950 US Navy minesweepers began what was planned as a simple mine-clearing operation at Wonson harbor. The operation degenerated into the greatest in a long line of embarrassments that mark the history of US mine countermeasures (MCM). While encountering only light resistance from shore batteries, four allied vessels were destroyed in minefields of alarming sophistication (see figure 1). Worse, the problems in clearing the minefields delayed D-Day for five full days, by which time the landing became irrelevant.[1]

Wonson has served as a rallying point for critics who argue, justifiably, for improvements in the US Navy's MCM capabilities. Yet these critics have learned only one of the lessons from this debacle. The most important lesson from Wonson is not that North Korea used mines *effectively* against an unprepared adversary; rather, it is that this belligerent failed to employ its mine arsenals *decisively*. Put bluntly, the North Koreans never fully integrated their minefields with other shore or sea-based defenses; consequently, they never threatened the ultimate objectives of the US Navy in Korea.

History points to other cases where the mining power was far more successful. In conflicts as diverse as the American Civil War and the Gallipoli Campaign of WWI, the difference between integrating the naval mine into a complete maritime strategy and simply laying mines as stand-alone weapons meant the difference between victory and defeat. It is the major thesis of this paper that naval mining can constitute a *decisive* factor in littoral warfare when properly integrated with other maritime components.

Mine Warfare: An Integrated Approach

In the history of modern warfare, no other weapon has suffered from an image problem as intractable as that of the naval mine. The roots of this date back to the first widespread employment of mines during the Civil War, when Admiral Farragut

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[1] James A. Field, United States Naval Operations: Korea (Washington, D.C.:U.S. Government Printing Office, 1962), 233-235.

condemned them as weapons "unworthy of a chivalrous nation."[2] Yet it is Alfred Thayer Mahan, the father of modern naval warfare, who is credited with codifying this derogatory attitude into naval doctrine:

> Mahan emphasized the historic tradition of sea mines as the weapons of weaker, inferior naval powers, rather than of great powers with command of the seas. Those who followed Mahanian theory often denied the effectiveness of mining and MCM.[3]

In one sense, at least, Mahan could not have been more correct. The *weaker, inferior naval powers* that line the world's littoral waters have increasingly turned to mines as the lynch pin of their maritime defenses.

The naval mine offers advantages to a littoral nation that no other weapon can match. It is the least expensive, most cost-effective of all maritime weapons; the Iranian mine that caused $96 million worth of damage to the *USS Samuel B. Roberts* probably cost less than $25,000 to procure.[4] Unlike a missile, a shell, or even a torpedo, the mine is a stealthy, silent warrior that gives little or no warning before its attack. Most significantly, a well-placed mine will virtually guarantee hull rupture, may break a vessel's keel, and will probably render its weapon systems inoperative. This is exactly the pattern of damage that was sustained by the *Roberts*.[5]

On the operational level, the greatest advantage to be leveraged from mines is their proven ability to effect sea denial by limiting or eliminating an adversary's freedom of action. "The large scale use of mines" writes Stephen Keller, "can constrain an enemy's operational choices and weaken him."[6] This is precisely the effect Donitz had in mind when he ordered his U-Boats to lay hundreds of mines off the east coast of the United States in 1942. Although his minefields managed to sink 12 ships, the greater

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2 Tamara Moser Melia, "Damn the Torpedoes": A Short History of U.S. Naval Mine Countermeasures 1777-1991 (Washington, D.C.: Naval Historical Center, Department of the Navy, 1991), 10.

3 Ibid., 24.

4 Edward J. Walsh, "Navy Adopts New Doctrine, New Technologies to Address Changing Mine Countermeasures", Defense Electronics, July 1992, 41.

5 Melia, 127.

6 Stephen H. Keller, "What Weapons That Wait", Proceedings, October 1994, 44-45.

impact of Donitz's action was psychological[7] - simply the fear of striking mines resulted in "sealing ports from Nova Scotia to Panama for up to 16 days."[8]

The only problem with Donitz's plan, of course, was that after 16 days most of the mines had either been swept or sidestepped. This highlights the one serious drawback of mine warfare - the vulnerability of mines to counterdetection. Once a mine is located, its destructive potential is effectively terminated. Unlike most other weapons, mines can be neutralized simply by marking their positions and rerouting surface traffic accordingly.

Integrated naval mining defeats mine countermeasures while maintaining the advantages of mines over space and time. Minefields covered by anti-ship missiles or dedicated strike aircraft will prove prohibitively expensive for an adversary to clear. At the same time, an adversary operating in waters known to be mined will have his freedom of maneuver drastically curtailed, making him an easier target. It is this combination that makes integrated mining so potentially decisive.

Four operational conditions must be produced in a littoral theater to fully integrate naval mining. First, and most critically, minefields must be complimented by other maritime components[9]. Mines deployed without the support of surface units, SSM platforms, or strike aircraft will be vulnerable to countermeasures and will have only a temporary effect on the maneuverability of an adversary. Second, minefields must be logically sewn in locations that either defend one's own center of gravity or that strike at an enemy's center of gravity. During Operation *Starvation*, the largest aerial mining operation in history, Nimitz specifically targeted the Shimonoseki Straits because they represented Japan's critical supply link to the Far East.[10]

Third, mines must be deployed as clandestinely as possible. "The value of sea mining is greatly enhanced when the positions, or even the approximate positions, of

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7 CDR James A. Meacham, USN, "Four Mining Campaigns: An Historical Analysis of the Decisions of the Commanders", Naval War College Review, June 1967, 99. "The enemy, once he is mined, will be overcautious because of the severe consequences of being wrong on the risk side."

8 Scott C. Truver, "Weapons that wait...and...wait", Proceedings, February 1988, 34.

9 Keller, ibid.

10 Meacham, 95.

the mines are unknown to a foe", wrote John Townshend Bucknill, an early expert in the application of mine warfare. "*Secrecy is therefore essential.*". [11] Fourth, operational design must incorporate a joint, survivable C3I system capable of relaying accurate targeting information while monitoring an adversary's MCM activities. The most laudable feature of Operation *Starvation* was the dedicated use of aerial photography to provide round-the-clock intelligence on Japanese minesweeping activity, alerting allied planners to remine swept shipping lanes.[12]

To varying degrees, these four conditions are exemplified in two outstanding case studies, the Confederate defense of Charleston Harbor in 1863 and the 1915 Turkish stand in the Dardanelles. Although both of these examples are defensive in nature, it is important to note that integration can be just as decisive in offensive mining (as was proven by Operation *Starvation*). Charleston and The Dardanelles have something in common, however, that merits special attention here - they both illustrate how *weaker, inferior naval powers* can deny the objectives of more advanced powers through the intelligent application of naval mining.

Charleston and the 'Wall Of Kaphez'

The plan to take Charleston, the 'cradle of the rebellion', was conceived by Assistant Secretary of the Navy Gustavus Fox following the Monitor-Virginia duel of March 9, 1862. Fox and his superior, Secretary Welles, believed that an ironclad fleet commanded by Admiral Dupont "could steam right past the Confederate fortifications guarding the entrance to Charleston Harbor and, once inside, compel the city to surrender by threat of bombardment."[13] The plan hatched in Washington

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[11] John Townsend Bucknill, Submarine Mines and Torpedoes (London: Office of Engineering, 1889), 168. In some instances, it may not be desirable to deploy mines clandestinely. This is normally the case when the objective of mining is primarily political. No attempt was made to maintain secrecy during the mining of Haiphong harbor, for example, since the objective was to the force the North Vietnamese back to the Paris peace negotiations.

[12] Meacham, 101. The interrogation of Captain K. Tamura, IJN offers an insight into the importance of remining. "...When you continually dropped [mines] it meant we were using [MCM] equiptment 24 hours a day...A continuous defense is hard to keep up."

[13] Robert J. Schneller, "A Littoral Frustration: The Union Navy and the Siege of Charleston, 1863-1865", Naval War College Review, Winter 1996, 38-39.

underestimated one critical aspect of the Confederate defenses, however - the depth and sophistication of the underwater obstructions guarding the harbor's approaches (see figure 2).

The defense of Charleston was entrusted to a brilliant engineering officer, General Pierre Beauregard, who enjoyed joint operational command and control over all Confederate forces in the vicinity of Charleston. Beauregard immediately set out to integrate the heavy batteries on Forts Sumpter, Wagner, and Moultrie with the new underwater technology pioneered by the South:

> The Confederate government actively funded underwater warfare and had established a "torpedo station" in Charleston. That city's underwater defenses consisted of mines (called "torpedoes" in those days), heavily constructed rope and log booms stretched across the channel to prevent ships from passing or to entangle their propellers, and pilings arranged to keep attacking ships in the main channel, *under the guns of the shore batteries.*[14]

Beauregard was also acutely aware of the potential for Union countermeasures. This is evidenced from his letter of April 24, 1863 to CS Secretary of War J. A. Seddon. In it, Beauregard asks for several powerful Whitworth guns "to cover at long range the bar and...also to keep the enemy from replacing buoys and surveying [the] bar...".[15]

The initial Union attempt to take Charleston consisted of an all-navy operation led by Rear Admiral S. F. Du Pont on April 7, 1863.[16] From his flagship *New Ironsides*, Du Pont commanded nine of the newest and most advanced ironclads afloat. His plan was simple. A mine countermeasures raft designed by John Ericsson had been fitted to the bow of the lead ironclad *Weehawken.* After breaching the mine barrage, the flotilla would sail past the outer fortifications, bombard Fort Sumter at close range, and eventually force the surrender of Charleston itself under threat of annihilation.

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[14] Ibid., 41. Emphasis added.

[15] Civil War Naval Chronology 1861-1865 (Washington, D.C.: Naval History Division, 1971), III-71.

[16] For a full account of Du Pont's attack, see "Detailed report of Rear-Admiral Du Pont, U.S. Navy", in Edward K. Rawson and Charles W. Stewart, Official Records of the Union and Confederate Navies in the War of the Rebellion, Series I Vol. 14 (Washington: Government Printing Office, 1902), 5.

annihilation.

The formidability of Beauregard's defenses would scuttle the union plan from the outset, however. Even though Ericsson's invention managed to detonate one of the Confederate mines, the raft degraded the maneuverability of the *Weehawken* to the point that the ironclad's skipper ordered it cut loose. Unable thereafter to penetrate the minefields and obstructions, the ironclads came under intense bombardment from the Confederate batteries; the ironclad *Keokuk* took ninety hits, sunk, and eventually became a Confederate war prize.[17] The disparity of expended rounds was similar throughout the flotilla; against the two thousand rounds fired by Fort Sumter alone, the ironclads had managed only 139.[18] Against such overwhelming firepower, Du Pont was forced to withdraw.

In his battle report to Secretary Welles, Rear Admiral Du Pont confirmed the decisiveness of the integrated underwater defense he encountered at Charleston. "Any attempt to pass through the obstructions I have referred to" wrote Dupont, "would have entangled the vessels", holding his ironclads "under the most severe fire of heavy ordnance that has ever been delivered."[19] But perhaps the greatest praise for Beauregard's defenses came from an epitaph of the Union operation appearing in the Baltimore *American:*

> *The ghosts of rebel torpedoes have...paralyzed the efficiency of the fleet...and the sight of large beer barrels floating in the harbor...added terror to overwhelming fear...The torpedo phantom has proved too powerful to be overcome...*[20]

Naval mining had come of age.

The Union Navy's second attempt to take Charleston was commanded by the famous naval ordnance inventor, Rear Admiral John Dahlgren, who had relieved Du Pont. Dahlgren was determined to find effective countermeasures to the Confederate

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17 "Report of General Beauregard, C.S.Army", ibid., 77-78.

18 Schneller, 43.

19 First report of Rear Admiral Dupont, US Navy to Honorable Gideon Welles, April 8, 1863, in Rawson and Stewart, 7.

20 C.C. Fulton, as cited in Milton F. Perry, Infernal Machines: The Story of Confederate Submarine and Mine Warfare (Baton Rouge: Louisiana State University Press, 1965), 52.

mines, yet his efforts would prove as fruitless as those of the *Weehawken.* While covering an MCM incursion at night, one of his ironclads, the *Patapsco,* struck a mine near Fort Sumpter and sunk with sixty two members of its crew onboard. Like his predecessor, the Union commander was rendered impotent before the "infernal machines" of the Confederacy. "Dahlgren's principal shortcoming" writes Schneller, "was his inability to develop a counter to the enemy's underwater defenses."[21]

Fifty two years later, the Turks faced a nearly identical problem in defending the Dardanelles from a combined Anglo-French invasion. By 1914, the Turks, under the command of the German harbor defense expert Rear Admiral Von Usedom, had devised a joint defensive plan to prevent the Allied fleet from taking Constantinople and controlling the maritime route to Russia. The defense incorporated 10 rows of minefields laid perpendicular from the Gallipoli Peninsula to Kaphez, with less than a mile between rows (see figure 3). The mines were far more lethal than the ones laid by the Confederacy, employing a mix of contact and shore-detonated variations.

Like the batteries at Charleston, the minefields rimming the Dardanelles were protected by a series of fixed and mobile heavy caliber guns. The Turks added two critical enhancements to Beauregard's scheme, however. The first was the use of high powered searchlights to counter allied MCM efforts at night[22]. The second, the flexible employment of offensive mining to augment the defensive fields, would prove decisive in the engagements that followed.

The Anglo-French fleet began surface actions against the Dardanelles on February 19, 1915 combining naval bombardment with minesweeping activities. By March 1, the warships had worked their way into the inner portion of the waterway near Suan Dere, and it is here that they first encountered the minefields layed by the Turks. From March 11-17, the minesweepers, decimated and demoralized by underwater detonations and heavy shellfire, attempted in vain to clear the deep water channel. It was evident that the Turks had placed great emphasis on defending their mines.[23]

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21 Schneller, 57.

22 Mcacham, 77-78.

23 Melia, 29.

The failure of the night sweeps led the British commander, Admiral de Robeck, to attempt to force the Dardanelles on March 18 with virtually every ship in his command. He was unaware, however, that Turkish intelligence had carefully reconnoitered the embarkation point of his battleships at Eren Keui Bay and had deployed an offensive minefield there. The result was one of the worse naval disasters in allied history. Three battleships, the *Bouvet*, *Ocean*, and *Irrestible*, were sunk after striking mines; three others (two damaged by gunfire) were in such bad condition as to require dry docking.[24] Numerous other combatants were sunk or beached. With a third of his command out of action, de Robeck ordered his ships to withdraw.

The conclusions reached by the combined Anglo-French commanders after the disaster of March 18 serve as an excellent synopsis of a decisive integrated mining operation. The humiliated admirals meeting onboard the *Queen Elizabeth* were forced to admit that:

> ...the battleships could not force the straits until the mine field had been cleared - the mine field could not be cleared until the concealed guns which defended them were destroyed - they could not be destroyed until [Gallipoli] was in our hands...[25]

It can be said with confidence, then, that the disastrous landing at Gallipoli was a direct result of the success of integrated naval mining in the Dardanelles.

In summary, the defenders at Charleston and the Dardanelles produced a defined set of conditions which fully integrated mine warfare into their defensive operations. Strategic centers of gravity were correctly identified and mined; the enemy was unable to ascertain the location or numbers of the mines; each minefield lay within the effective range of shore-based batteries; joint command, control, and intelligence were brilliantly employed to exploit the adversary's paralysis. The prevalence of these conditions allowed the Confederates and the Turks to defeat adversaries who were both numerically and technologically superior.

The question, then, is whether any littoral nation in 1996 is capable of duplicating

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24 Br.-General C. F. Aspinall-Oglander, "Military Operations: Gallipoli" in Official History of the War, Vol. 1 (London: William Heinemann Ltd., 1929), 96-98.

25 Lord Wester-Wemyss, G.C.B., The Navy in the Dardanelles Campaign (London: Hodder and Stoughton Ltd., 1924), 41-42.

these conditions.

Modern Applications: Iran and the Persian Gulf

In mining the Persian Gulf in 1987, Iran probably received its inspiration from Libya's terrorist mining of the Red Sea.[26] However, Iran appears to have learned the wrong lessons from this incident. The leaders in Teheran had correctly discovered two of the great advantages of mine warfare - its destructive power in littoral environments and its psychological effect on mariners and insurers.[27] Yet they concluded, incorrectly, that mines alone could effect sea denial. The mistake would end up costing Iran half of its navy.

The objective of the Iranian mining operation was to prevent Kuwait, who had actively sided with Iraq towards the end of the Gulf War, from exporting oil through the Strait of Hormuz. Beginning in 1987, the Iranian Revolutionary Guard began sewing hundreds of M-08 moored mines along key merchant routes throughout the Persian Gulf.[28] In July 1987, the mines found their first victim when the reflagged Kuwaiti tanker *Bridgeton* struck an M-08 while in transit. That attack finally provoked the United States into dispatching minesweepers and AMCM helicopters later that month. The US Navy also reinforced its carrier battle group stationed off of Oman.

Two events triggered the demise of the Iranian operation. The first was the detection of the freighter *Iran Ajr* in the process of deploying mines near the Strait of Hormuz.[29] The second, and more important, was the mining of the *USS Roberts.* Having established both cause and effect, the Reagan Administration ordered a rapid and decisive strike on April 14, 1988 against Iranian naval combatants and refining platforms, code named *Preying Mantis.* Despite determined resistance from the Iranian Navy, *Preying Mantis* succeeded in damaging or sinking the finest vessels in the

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26 Michael Palmer Guardians of the Gulf: A History of America's Expanding Role in the Persian Gulf, 1833-1992 (New York: The Free Press, 1992), 131. In the summer and fall of 1984, nineteen ships struck mines along common merchant routes in the Red Sea. An international sweeping effort cleared the mines later in that year. The mines did manage to bring shipping to a temporary standstill, however.

27 Ibid.

28 Melia, 120. The M-08 was derived from a Russian design that predated the Dardanelles Operation.

29 Howard S. Levie, Mine Warfare at Sea (Dordrecht: Kluwer Academic Publishers, Inc., 1992), 168.

Iranian Order of Battle while destroying two critical gas-oil separation platforms.[30] Within weeks, all mining activity terminated.

Iran's failure to achieve its objective in the Gulf stemmed from its employment of mines as stand-alone weapons. Although the Revolutionary Guard correctly targeted the enemy's center of gravity - the tanker convoys - they failed to maintain secrecy, as evidenced by the *Iran Ajr* incident. They also failed to reconnoiter the activities of US minesweeping units and to replace fields that had already been swept. Inexplicably, the Iranian Navy was committed in force only *after* most of the mines had been cleared,[31] when the American Surface Action Groups (SAG) operating in the Gulf had reachieved complete freedom of action.

In the eight years that have past since *Preying Mantis*, Iran's military leadership appears to have learned much from its mistakes.[32] The evidence for this comes from two sources - the pattern of weapons procurement in the current five year plan, and the nature of recent Iranian military exercises. Both would indicate that Teheran is developing the rudiments of an integrated mining capability.

Since the fall of 1993, Iran has conducted a series of advanced maritime exercises which combine air, surface, subsurface, and mining forces under a unified C3I architecture. Beginning with *Lightening 3*, the Iranians have demonstrated an impressive capacity to conduct joint coordinated action under centralized control:

> The main objectives of the exercise were to test: strategic command, control, communications and intelligence distribution, between Teheran and the main strategic headquarters, primarily the activation of missiles on order from Teheran and theatre-wide engagement with US Navy forces; testing of the missile crews...and testing diverse forms of electronic warfare.[33]

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30 Palmer, 139-144.

31 Iranian naval units did engage in limited surface strikes against tankers before mining operations commenced. The most notable was the action of the frigate *Sabalan.*

32 Anoushiravan Ehteshami "Iranian Rearmament Strategy under President Rafsanjani", Jane's Intelligence Review, July 1992, 312-313. It should also be noted that Iran had a front row seat to Desert Storm, "which displayed the resolve and the military capabilities of the Western countries to the full".

33 Yossef Bodansky, "Iran's Persian Gulf Strategy Emerges Through Its Recent Military Exercises", Defense & Foreign Affairs Strategic Policy, January 31, 1994, 4.

One other objective with specific implications for integrated mining included the testing of "the strategic war and operational rooms, and their ability to receive information from coastal radars".[34]

Once testing of the new C4I architecture was complete, Iran introduced mining scenarios into the *Nasr 1* naval exercise. *Nasr 1* focused primarily on sea denial activities in the shipping routes of the Persian Gulf. The objective was to improve the interoperability of Republican Guard units ,who appear to have retained sole control of the mining mission, with other regular naval components. Within this context, Teheran appears to have elevated naval mining to the status of a "strategic special operation".[35]

On the procurement side, Iran has directed its acquisitions program at two key weapons of sea denial - naval mines and antiship missiles (SSM).[36] With regards to integrated mining, SSM effectively replaces the role played by surface gun batteries, as outlined in the earlier case studies. Iran now possesses significant numbers of Chinese C802 antiship cruise missiles and is working to deploy these weapons on a growing fleet of fast patrol craft. The C802's are complimented by scores of older CSS-3 Seersucker missiles, deployed from mobile launchers hidden in the vicinity of Bandar Abbas.[37]

As for its mine inventories, Iran is known to possess thousands of dated Russian and Yugoslavian mines which, like the M-08, are generally vulnerable to standard MCM. What is most disturbing to CENTCOM officials is that Iran now appears set to acquire EM-52 rising mines from China. These bottom mines are believed to possess advanced influence and delay mechanisms and are ideally suited for strategic mining of the Strait of Hormuz.[38] By their very nature, they present an enormous problem to

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34 Ibid.

35 Ibid. Although not specified by Bodansky, this appears to be synonymous with "operational fires with strategic objectives."

36 Major Dale R. Davis "Iran's Strategic Philosophy and Growing Sea-Denial Capabilities", Marine Corps Gazette, July 1995, 21.

37 Phillip Finnegan and Robert Holzer "Iran Steps up Mine, Missile Threat", Defense News, Nov. 27 - Dec xx, 1995, 29. The inability fo coalition forces to locate mobile Scud launchers in Iraq is probably why Iran is now so interested in this method of missile deployment.

38 Finnegan and Holzer, 3, 29.

MCM planners.[39]

Another Iranian acquisition that warrants special attention is the purchase of between 3 to 5 Kilo-class diesel submarines from Russia. The Kilos have caused much alarm in Western defense circles concerning their potential to conduct torpedo attacks against carrier battle groups. Yet this alarm is probably misplaced. The poor sound propagation characteristics of the Gulf littoral, the vulnerability of diesel submarines to nonacoustic detection, and the location of their home port outside the Persian Gulf all mitigate against the use of the Kilos in the surface attack role. Instead, it is far more likely that the Kilos will be used as a mine-laying platform.[40] This would give Iran something it desperately lacked in 1987 - *secrecy*.

In recent months, U.S. Navy officials have publicly acknowledged that Teheran "is developing an integrated missile and mine capability" that will challenge the Navy's hegemony over the Persian Gulf. Their concerns are echoed by Vice Admiral Scott Redd, Commander, U.S. Naval Forces Central Command, who has stated that this littoral power now possesses "an integrated capability that is by far the most significant naval threat" in the region.[41] Iran, it would appear, has indeed done its homework.

The Role of MCM

From the start of the tanker escort operation in 1987, the decision not to send minesweepers or MCM-capable helicopters to the Gulf was based upon a calculated risk taken by the Reagan Administration - that Iran could be deterred from deploying mines under threat of overwhelming retaliation. Michael Armacost, Undersecretary of State for Political Affairs, went so far as to say that "it would be foolhardy for [the Iranians] to attack an American flag vessel."[42] As subsequent events would reveal, this represented a serious underestimation by intelligence sources of both Iran's will

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39 See Sheila Galatowitsch, "Undersea Mines Grow Smarter and Deadlier", Defense Electronics, March 1991.

40 John Boatman and Mark Hewish, "Naval mine countermeasures: finding the needle in the haystack", International Defense Review, No. 7, 1993, 559. Iran has reportedly purchased 1,800 tube-launched mines for deployment from these submarines.

41 Finnegan and Holzer, 3.

42 Testimony of Michael Armacost before the Senate Armed Services Committee in Palmer, 129.

and of its surprising acumen in mine warfare. Iran did sew mines in the Persian Gulf, and the US Navy had to rely heavily on its European allies to clear them.[43]

Three years later, just weeks before the start of Desert Storm, Pentagon officials had all the evidence they could ask for regarding Iraq's mining intentions. As early as November 1990, it became apparent that the Iraqis had begun a massive defensive mining operation in the north Persian Gulf. "We were seeing that the minelayers were going to sea every night and coming back every day" noted Vice Admiral Arthur, commander of US Naval Forces in the Gulf. "And we knew they were popping in somewhere between 40 and 80 mines every night..." In December, Arthur requested permission to begin mine countermeasures while strafing Iraqi minelayers. He was turned down, and Iraq was permitted to sew over 2,500 mines in the Gulf.[44] Once again, European MCM units performed the lion's share of mine clearance.

These episodes highlight two other reasons why integrated naval mining is such an attractive option to littoral nations. The first is the equivocation evidenced in American defense circles over the degree of threat posed by naval mining and the corresponding low intelligence priority assigned to it.[45] The second, and far more important, is the view of mine countermeasures as a secondary mission of the United States Navy, to be performed preferably by external units.

With the exception of brief episodes in WWII, where minesweepers enjoyed the complete dedication of protective carrier battle groups,[46] MCM has been a "go it alone" business. This attitude still persists today; the Navy's most capable MCM asset, the mine-hunting helicopter, now resides entirely in the Naval Reserves under a mixed force structure. Yet this is precisely the type of MCM employment that favors integrated naval mining. Without the presence of a protective battle group with indigenous countermine assets, it is doubtful whether lone MCM units could survive

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[43] David Foxwell, "Mine warfare in an uncertain world: US emphasises shallow-water MCM", International Defense Review, Vol. 25 No. 5, May 1992, 426.

[44] Anthony Preston, "Allied MCM in the Gulf", Naval Forces, 48.

[45] Lee M. Hunt, "In Stride", Proceedings, April 1994, 59.

[46] Ibid.

for long in an integrated littoral environment - let alone succeed in clearing mines.

Conclusion

This paper has attempted to elicit from naval history a number of conditions that differentiate singular versus integrated applications of naval mining. Further, it has argued that integrated naval mining has proven decisive in a number of noteworthy conflicts - and may prove decisive yet again. Any analysis using this approach, however, must be subject to a severe test of relevancy. Air warfare did not exist at the time of the Union engagements at Charleston; it played only a limited role in the allied attempt to force the Dardanelles. Yet the primacy placed on deep strike and airborne insertion under current US warfighting doctrine raises the question of whether any littoral nation can hope to achieve its objectives through the use of mining.

It is equally valid, albeit axiomatic, to note that oil tankers and bulk carriers cannot fly. So long as the West remains critically dependent on oil and other vital resources that flow through strategic waterways, any nation wishing to interdict that flow would be foolish not to lay mines. And as long as the United States retains its Mahanian bias against MCM forces, relegating them to an ancillary role outside the battle group, the attractiveness of integrated mining can only increase.

In addition, the same technological advances in microprocessing that have revolutionized warfare above the waterline are now doing the same for mine warfare. Enhancements such as burrowing bottom mines, long range selection and arming through ELF (extremely low frequency) and acoustic broadcast, and self-contained defensive measures,[47] will make the task of MCM much more difficult. Which, in turn, makes the task of integration that much easier. "Minehunting is both difficult and time-consuming", notes the editor of Naval Forces. "If carried out in the face of determined opposition, it is likely to become even more hazardous."[48]

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47 For a discussion of future naval mining technology, see Tom Bowling, "A New Mine Warfare Threat" in Canadian Defence Quarterly, Winter 1990, 17-22.

48 "Advances in Mine Warfare", Naval Forces, 1990 (Vol 11 No. 6), 49-53.

ILLUSTRATIONS

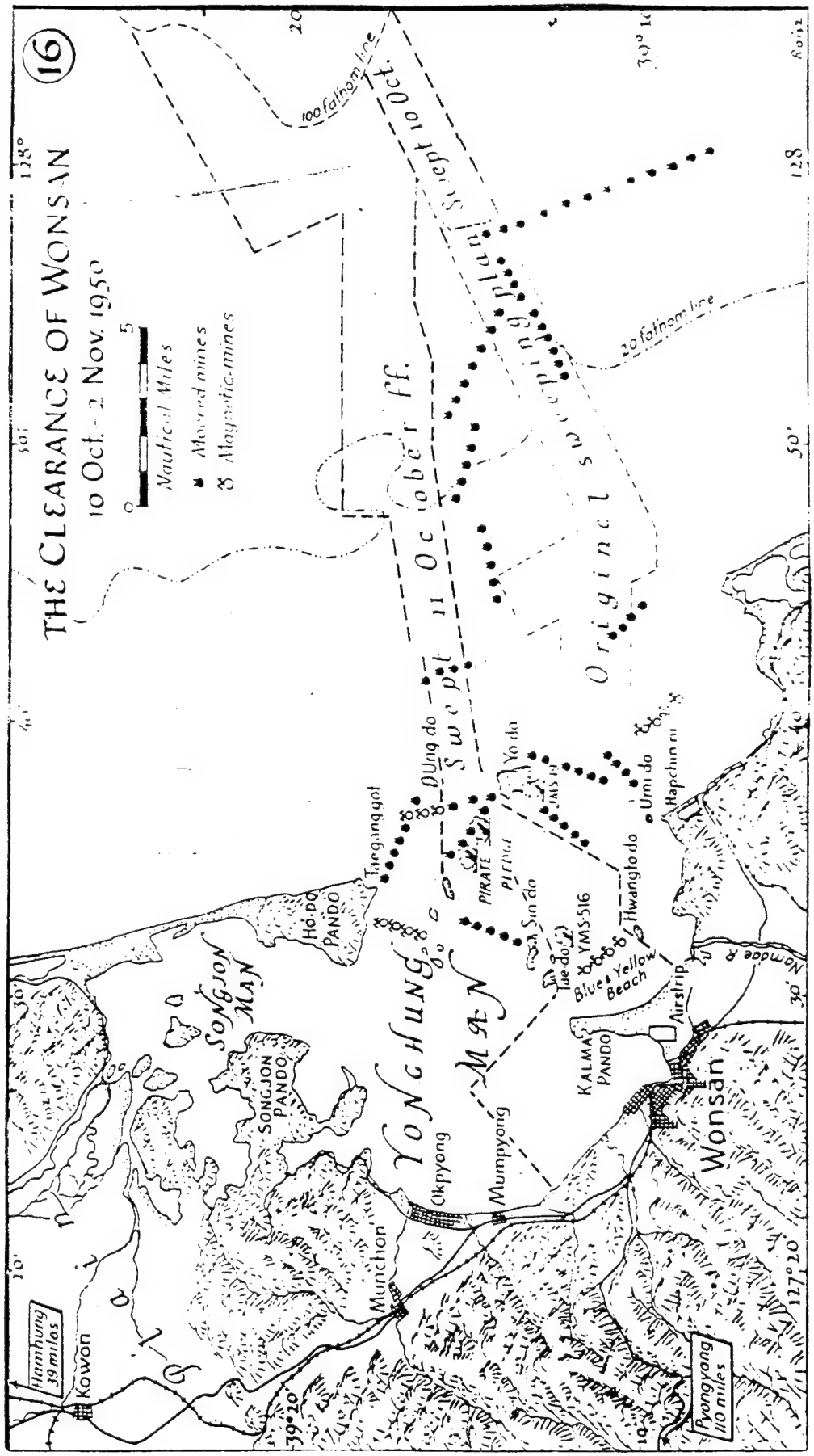

Figure 1. North Korean minefields at Wonson.
Source: James A. Field, United States Naval Operations:Korea (Washington: US Government Printing Office, 1962), 234.

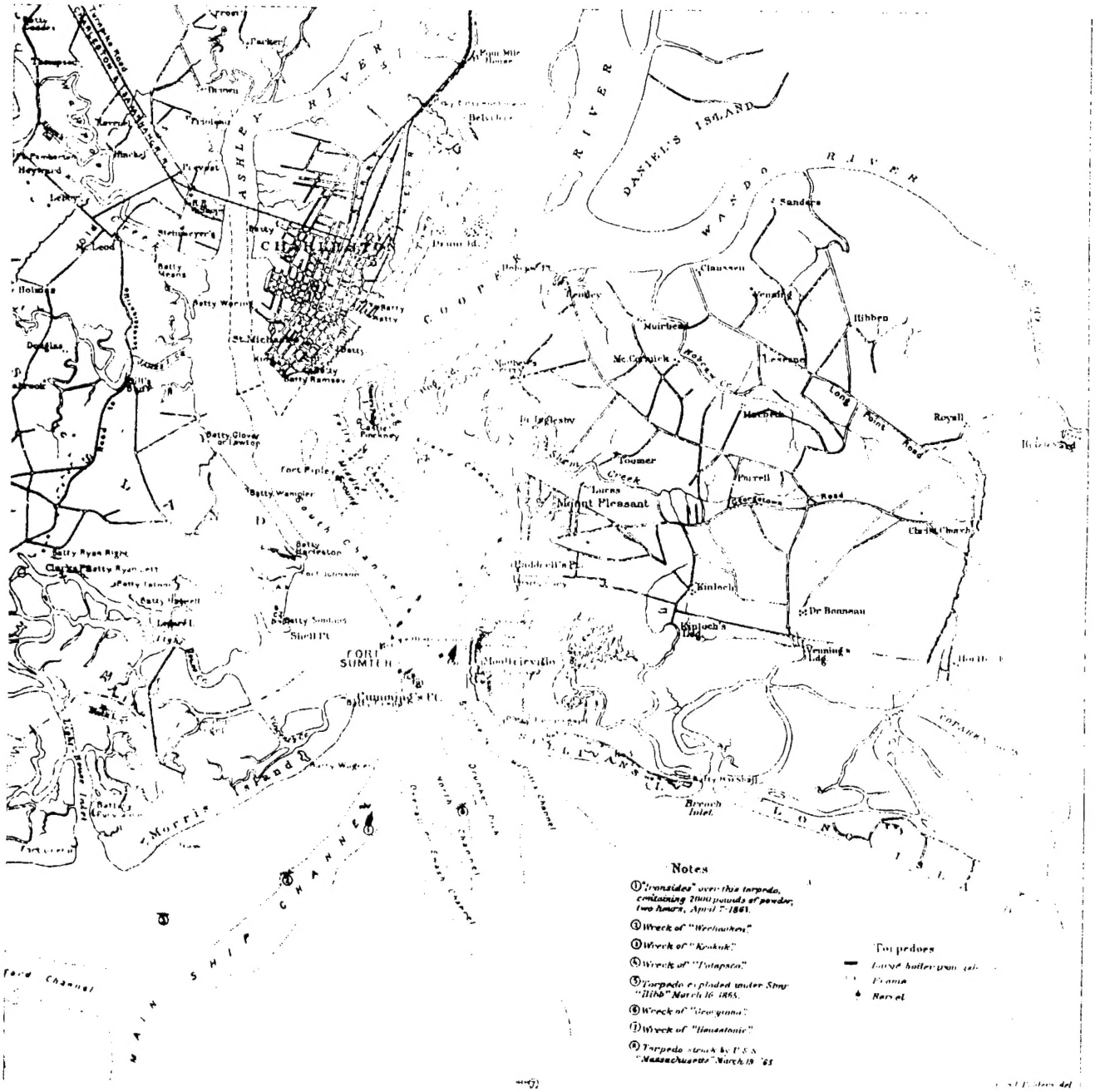

Figure 2. Beauregard's defenses at Charleston
Source: Edward K. Rawson and Charles W. Stewart, Official Records of the Union and Confederate Navies in the War of the Rebellion, Series I Vol. 14 (Washinton: Goverment Printing Office, 1902), 5.

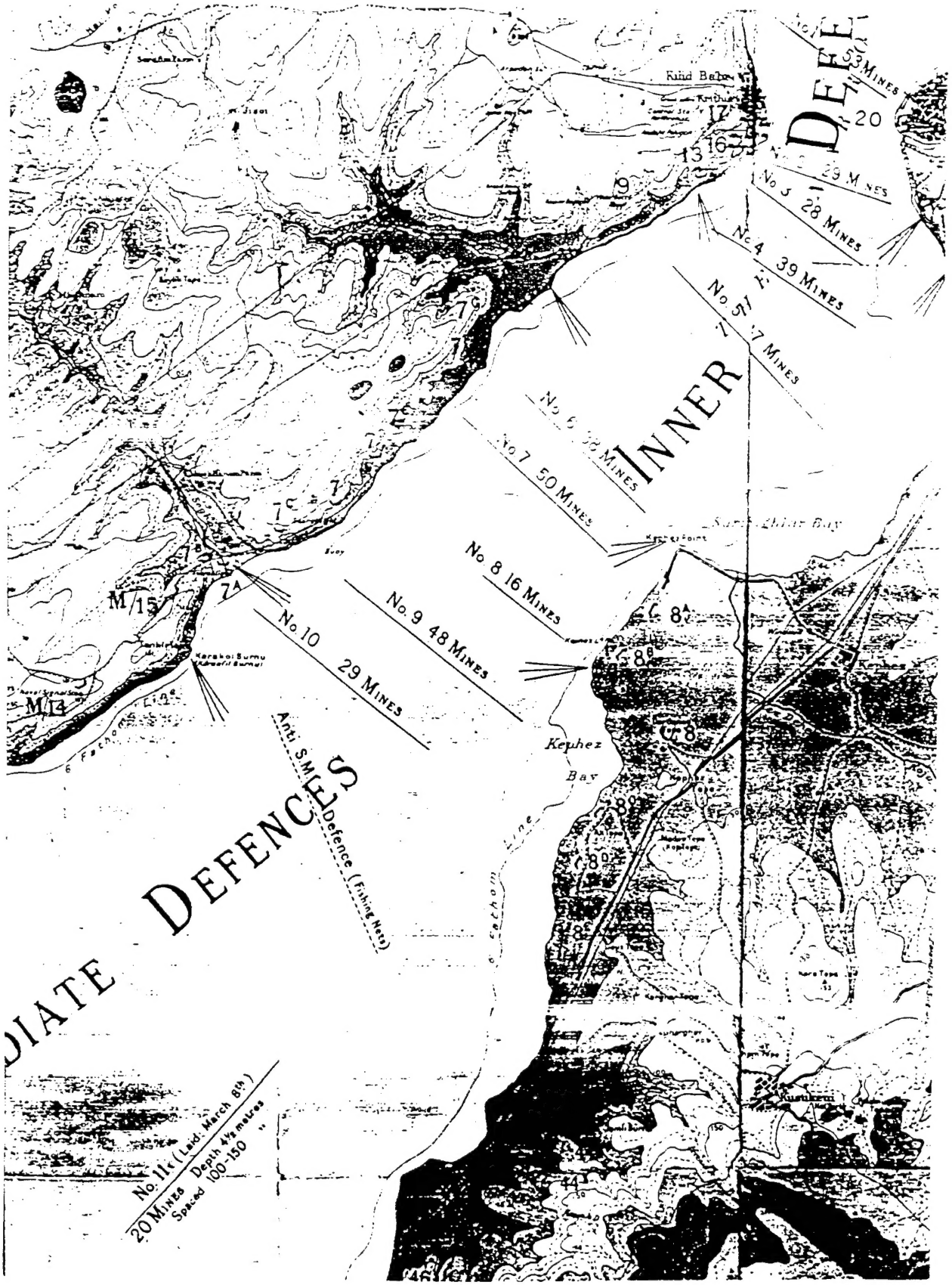

Figure 3. The Wall of Kaphez.
Source: Br.-General C.F. Aspinall-Oglander, Official History of the War, Vol. 1, Maps and Appendices, (London: William Heinemann Ltd., 1929).

BIBLIOGRAPHY

Primary Sources

Rawson, Edward K. and Charles W. Stewart, Official Records of the Union and Confederate Navies in the War of the Rebellion, Series I Vol. 14. Washington: Government Printing Office, 1902.

Wester-Wemyss, Lord, The Navy in the Dardanelles Campaign. London: Hodder and Stoughton Ltd., 1924.

Secondary Sources

Aspinall-Oglander, C. F., Official History of the War, Vol. 1, Military Operations: Gallipoli. London: William Heinemann Ltd., 1929.

Bucknill, John Townsend, Submarine Mines and Torpedoes. London: Office of Engineering, 1889.

Civil War Naval Chronology 1861-1865. Washington, D.C.: Naval History Division, 1971.

Field,James A., United States Naval Operations: Korea. Washington, D.C.:U.S. Government Printing Office, 1962.

Levie,Howard S., Mine Warfare at Sea. Dordrecht: Kluwer Academic Publishers, Inc., 1992.

Melia, Tamara M., Damn the Torpedoes: A Short History of U.S. Naval Mine Countermeasures 1777-1991. Washington, D.C.: Naval Historical Center, Department of the Navy, 1991.

Palmer, Michael, Guardians of the Gulf: A History of America's Expanding Role in the Persian Gulf, 1833-1992. New York: The Free Press, 1992.

Perry, Milton F., Infernal Machines: The Story of Confederate Submarine and Mine Warfare. Baton Rouge: Louisiana State University Press, 1965.

Periodicals

"Advances in Mine Warfare." Naval Forces, 1990 (Vol 11 No. 6), 49.

Bodansky, Yossef, "Iran's Persian Gulf Strategy Emerges Through Its Recent Military Exercises." Defense & Foreign Affairs Strategic Policy, January 31, 1994, 4.

Bowling, Tom, "A New Mine Warfare Threat." Canadian Defence Quarterly, Winter 1990, 17.

Davis, Dale R., "Iran's Strategic Philosophy and Growing Sea-Denial Capabilities." Marine Corps Gazette, July 1995, 21.

Ehteshami, Anoushiravan, "Iranian Rearmament Strategy under President Rafsanjani." Jane's Intelligence Review, July 1992, 312.

Finnegan, Phillip and Robert Holzer, "Iran Steps up Mine, Missile Threat." Defense News, Nov. 27 - Dec 4, 1995, 29.

Foxwell, David, "Mine warfare in an uncertain world: US emphasises shallow-water MCM." International Defense Review, Vol. 25 No. 5, May 1992, 426.

Hunt, Lee M., "In Stride." Proceedings, April 1994, 59.

Keller, Stephen H., "What Weapons That Wait." Proceedings, October 1994, 44-45.

Meacham,James A., "Four Mining Campaigns: An Historical Analysis of the Decisions of the Commanders." Naval War College Review, June 1967, 99.

Preston, Anthony, "Allied MCM in the Gulf." Naval Forces, 48.

Schneller, Robert J., "A Littoral Frustration: The Union Navy and the Siege of Charleston, 1863-1865", Naval War College Review, Winter 1996, 38.

Truver, Scott C., "Weapons that wait...and...wait." Proceedings, February 1988, 34.

Walsh, Edward J, "Navy Adopts New Doctrine, New Technologies to Address Changing Mine Countermeasures." Defense Electronics, July 1992, 41.